

Patent Claims

1. Assembly that works with surface acoustic waves and that contains a piezoelectric substrate
on which are located
 - a signal line with an asymmetrically shaped first electrical port that has a signal-
5 conducting terminal
(P1) and a second electrical port, and
 - a first and a second partial filter, that are connected in series between the first
and the second ports,
 - the first partial filter having a first serial transducer (W21) and a second
10 serial transducer (W22) that are located in an acoustic path (S2),
 - the first serial transducer (W21) and the second serial transducer (W22)
being located in series branches of the signal line
 - the first serial transducer (W21) and the second serial transducer (W22)
being acoustically coupled with one another,
 - 15 - the second partial filter contains a DMS path (S3) that has a first
coupler transducer (AW31) and a transducer (MW3) that is end-positioned in the signal
line.
2. Assembly in accordance with Claim 1,
20 in which the DMS path has a second coupler transducer (AW32).
3. Assembly in accordance with Claim 2,
in which the end-positioned transducer (MW3) is placed between the coupler transducers
(AW31, AW32).
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4. Assembly in accordance with one of the Claims 1 to 3,
in which each path is bounded on both sides by reflectors.
5. Assembly in accordance with one of the Claims 1 to 4,
30 in which there are additional serial transducers in the acoustic path (S2) of the first
partial filter, that are located in series branches of the signal line and are

electrically connected in series with the coupler transducers (AW31, AW32) of the DMS path.

6. Assembly in accordance with one of the Claims 1 to 5,

in which there are additional coupler transducers and / or additional end-positioned transducers in the DMS path, the coupler transducers and the end-positioned transducers being alternately arranged, at least in part.

7. Assembly in accordance with one of the Claims 1 to 6,

in which a reflector (R23) is placed between each of the serial transducers (W21, W22).

8. Assembly in accordance with one of the Claims 1 to 7,

in which the second port is symmetrical and has a first terminal (P21) and a second terminal (P22).

9. Assembly in accordance with Claim 7,

in which a reflector (R23) is placed between the first serial transducer (W21) and the second serial transducer (W22), and in which the signal-conducting terminal (P1) of the first port is connected to this reflector (23).

10. Assembly in accordance with one of the Claims 1 to 7 or 9,

in which the second port is asymmetrical as well.

11. Assembly in accordance with one of the Claims 1 to 10,

in which the first partial filter is connected with the first port, in which the second port is connected with the end-positioned transducer (MW3) of the DMS path, and in which the first (AW31) and / or the second (AW32) coupler transducer of the DMS path is connected in series with at least one of the serial transducers (W21, W22).

12. Assembly in accordance with one of the Claims 1 to 11,

in which the first partial filter has an additional acoustic path (S1) that is connected

with the first port, which path has a parallel transducer (W1) that is connected between the signal line and the ground.

- 5 13. Assembly in accordance with one of the Claims 1 to 12,
in which there are, within the first partial filter, several parallel transducers (W1) that are
located in an additional acoustic path (S1) which is
connected with the first port, and that are acoustically coupled with one another, and each of
which is connected between signal line and ground.
- 10 14. Assembly in accordance with one of the Claims 1 to 13, in which the end-positioned
transducer,
(MW3) of the DMS path has at least two partial transducers that are electrically
connected with one another, and that are connected in series between the terminals of the
15 second port.
15. Assembly in accordance with one of the Claims 1 to 14, in which the signal-conducting
terminal
(P1) of the first port is connected to at least one of the serial transducers
20 (W21, W22).
16. Assembly in accordance with one of the Claims 1 to 15,
in which the first partial filter has an additional acoustic path that has at least one serial
transducer, is connected with the first port, and is located in the signal line.
- 25 17. Assembly in accordance with one of the Claims 1 to 8,
in which the second partial filter is located on the side of the first port,
in which the first terminal (P21) of the second port is connected to the first serial
transducer (W21) and the second terminal (P22) of the second port is connected to
30 the second serial transducer (W22),

in which the end-positioned transducer (MW3) of the DMS path is placed in the signal line that is connected to the first port (P1), and in which the first coupler transducer (AW31) of the DMS path is connected in series with the first serial transducer (W21), in which the second coupler transducer (AW32) of the

5 DMS path is connected in series with the second serial transducer (W22).

18. Assembly in accordance with Claim 17,

in which the DMS path has at least two end-positioned transducers (MW31, MW32), in which the first (AW31) and the second (AW32) coupler transducer of the DMS path are

10 located between the end-positioned transducers (MW31, MW32), in which the first (AW31)

and the second (AW32) coupler transducer are placed next to each other and are connected with each other in series.

15 19. Assembly in accordance with Claim 17 or 18,

in which a serial resonator is connected between the first port and the end-positioned transducer

(MW3, MW31, MW32), the resonator having a transducer (W1) and reflectors (R11, R12)

20 that bound the transducer on both sides.

20. Assembly in accordance with Claims 17 to 19,

in which the second port is connected to an additional acoustic path with a first transducer

25 (W41) and a second transducer (W42) that are bounded on both sides by reflectors (R41, R42), the first terminal (P21) of the second port being connected to the first transducer (W41), the second terminal (P22) of the second port being connected to the second transducer (W42), the first transducer (W41) and the second transducer (W42) being acoustically coupled with one another.

Summary

An electronic assembly that works with surface acoustic waves

5 The invention concerns an electrical assembly that works with surface acoustic waves,
and that has an asymmetric entrance and a preferably symmetrical exit, with a DMS path (DMS
= double mode surface acoustic wave), that has at least one end-positioned transducer and at
least one coupler transducer, and with a two-port resonator that has at least two serial
10 the transducers of the two-port resonator. By using the connection of the paths in a circuit in
accordance with the invention, it is possible, in particular, to achieve slight insertion attenuation
with high suppression in the cutoff region of a band-pass filter, to keep the space requirement for
the assembly's structures small, and, if appropriate, to simultaneously implement the function of
a balun in the filter.

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Figure 1a